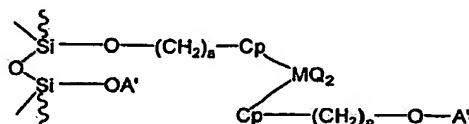


LISTING OF THE CLAIMS

1-3. (Canceled)

4. (Currently Amended) A supported metallocene catalyst of the following formula obtained by using a dehydroxylated silica support of the formula including a hydroxyl group amount of less than 0.5 mmol/g silica:



wherein M comprises a transition metal of Group 4;

Cp, which are the same or different, comprise a cyclopentadienyl ring, wherein the cyclopentadienyl ring is unsubstituted or substituted by a moiety selected from the group consisting of alkyl, cycloalkyl, aryl, alkenyl, alkylaryl, arylalkyl, and arylalkenyl;

Q, which are the same or different, comprise halogen or a moiety comprising from 1 to 20 carbon atoms, wherein the moiety is selected from the group consisting of alkyl, alkenyl, aryl, alkylaryl, arylalkyl, and alkylidene;

A', which are the same or different, are selected from the group consisting of methoxymethyl, t-butoxymethyl, tetrahydropyranyl, tetrahydrofuranyl, 1-ethoxyethyl, 1-methyl-1-methoxyethyl, and t-butyl; and

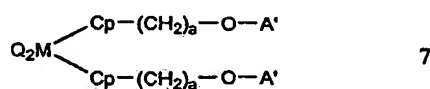
a comprises an integer of from 4 to 8.

5. (Original) The supported metallocene catalyst according to claim 4, wherein A' comprises t-butyl.

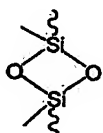
6. (Original) The supported metallocene catalyst according to claim 4, wherein a is 6.

7. (Currently Amended) A method for preparing a supported metallocene catalyst, the method comprising the step of:

reacting a metallocene compound of Chemical Formula 7:



with a dehydroxylated silica support of the following formula including a hydroxyl group amount of less than 0.5 mmol/g silica:



in an organic solvent, wherein:

M comprises a transition metal of Group 4;

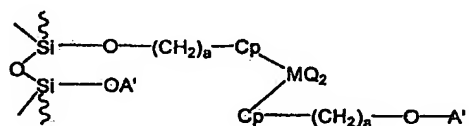
Cp, which are the same or different, comprise a cyclopentadienyl ring, wherein the cyclopentadienyl ring is unsubstituted or substituted by a moiety selected from the group consisting of alkyl, cycloalkyl, aryl, alkenyl, alkylaryl, arylalkyl, and arylalkenyl;

Q, which are the same or different, comprise halogen or a moiety comprising from 1 to 20 carbon atoms, wherein the moiety is selected from the group consisting of alkyl, alkenyl, aryl, alkylaryl, arylalkyl, and alkylidene;

A', which are the same or different, are selected from the group consisting of methoxymethyl, t-butoxymethyl, tetrahydropyranyl, tetrahydrofuranyl, 1-ethoxyethyl, 1-methyl-1-methoxyethyl, and t-butyl; and

a comprises an integer of from 4 to 8;

whereby one reactive bond between a silicon atom and an oxygen atom of the dehydroxylated silica support is cleaved, whereby one O-A' bond in the metallocene compound of Chemical Formula 7 is cleaved to yield a metallocene portion and A', and whereby two new bonds are formed, wherein the metallocene portion is bonded to the silicon atom of the dehydroxylated silica support via the oxygen atom previously bonded to A', and simultaneously A' is bonded to another silicon atom of the dehydroxylated silica support via the oxygen atom previously bonded to the silicon atom, to yield a supported metallocene catalyst of formula:

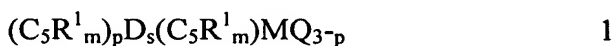


- 8. (Canceled)
- 9. (Original) The method according to claim 7, wherein A' comprises t-butyl.
- 10. (Original) The method according to claim 7, wherein a is 6.
- 11-14. (Canceled)

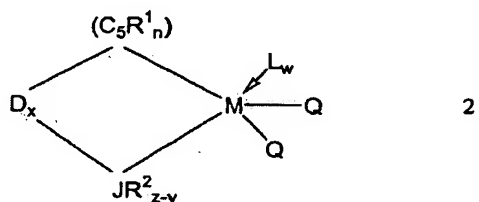
15. (Currently Amended) A supported metallocene compound prepared by the reaction of:

- a) a metallocene compound of Chemical Formula 1 or Chemical Formula 2, wherein

Chemical Formula 1 comprises:



and wherein Chemical Formula 2 comprises:



wherein at least one moiety selected from the group consisting of R^1 , R^2 , and D is substituted by a group of Chemical Formula 6, wherein:

M is a transition metal of Group 4;

$(C_5R^1_m)$ and $(C_5R^1_n)$ each comprise a cyclopentadienyl ring, wherein R^1 , which are the same or different, are selected from the group consisting of hydrogen, C_{1-40} alkyl, C_{3-40} cycloalkyl, C_{6-40} aryl, C_{2-40} alkenyl, C_{7-40} alkylaryl, C_{7-40} arylalkyl, C_{8-40} arylalkenyl, and a metalloid of Group 14 substituted by a hydrocarbyl group; or two R^1 form a hydrocarbyl group which joins together two adjacent carbon atoms of a cyclopentadienyl ring to form one or more C_4 - C_{16} rings;

D is selected from the group consisting of an alkylene carbon chain, an arylene carbon chain, an alkenylene carbon chain, a dialkyl germanium, a dialkyl silicon, an alkyl phosphine, an alkyl amine group substituting on and bridging two

cyclopentadienyl ligands, and an alkyl amine group substituting on and bridging a cyclopentadienyl ligand and JR^2_{z-y} ligand by covalent bonds;

R^2 is selected from the group consisting of hydrogen, C_{1-40} alkyl, C_{6-40} aryl, C_{2-40} alkenyl, C_{7-40} alkylaryl, and C_{7-40} arylalkyl;

J comprises an element of Group 15 or Group 16;

Q, which are the same or different, are selected from the group consisting of halogen, C_{1-20} alkyl, C_{2-20} alkenyl, C_{6-20} aryl, C_{7-20} alkylaryl, and C_{2-20} alkylidene;

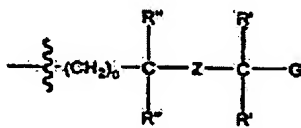
L comprises a Lewis base;

s is 0 or 1 and p is 0, 1 or 2, provided that when p is 0 then s is 0, when s is 1 then m is 4 and p is 1, and when s is 0 then m is 5 and p is 0;

when J is an element of Group 15 then z is 3, and when J is an element of Group 16 then z is 2;

x is 0 or 1, provided that when x is 0 then n is 5, y is 1, and w is greater than 0, and when x is 1, then n is 4, y is 2, and w is 0; and

wherein Chemical Formula 6 comprises:



6

wherein Z is an oxygen atom or a sulfur atom;

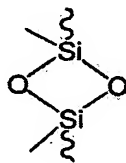
R', which are the same or different, are selected from the group consisting of hydrogen, C₁₋₂₀ alkyl, C₃₋₂₀ cycloalkyl, C₆₋₂₀ aryl, C₂₋₂₀ alkenyl, C₇₋₂₀ alkylaryl, C₇₋₂₀ arylalkyl, and C₈₋₂₀ arylalkenyl; or two R' are joined together to form a ring;

R'', which are the same or different, are selected from the group consisting of hydrogen, C₁₋₂₀ alkyl, C₃₋₂₀ cycloalkyl, C₆₋₂₀ aryl, C₂₋₂₀ alkenyl, C₇₋₂₀ alkylaryl, C₇₋₂₀ arylalkyl, and C₈₋₂₀ arylalkenyl;

G is selected from the group consisting of C₁₋₂₀ alkyl, C₃₋₂₀ cycloalkyl, C₆₋₂₀ aryl, C₂₋₂₀ alkenyl, C₇₋₂₀ alkylaryl, C₇₋₂₀ arylalkyl, and C₈₋₂₀ arylalkenyl, C₁₋₂₀ alkoxy, C₆₋₂₀ aryloxy, C₁₋₂₀ alkylthio, C₆₋₂₀ arylthio, phenyl, and substituted phenyl; or G and R' join together to form a ring;

a is an integer of 4 to 8, provided that when Z is a sulfur atom then G is alkoxy or aryloxy; and when G is not an alkoxy or aryloxy then Z is an oxygen atom; and

b) a dehydroxylated silica support of the following formula including a hydroxyl group amount of less than 0.5 mmol/g silica:



16. (Previously presented) The supported metallocene compound according to claim 15, wherein G is selected from the group consisting of hydrogen, C₁₋₂₀ alkyl, C₃₋₂₀ cycloalkyl, C₆₋₂₀ aryl, C₂₋₂₀ alkenyl, C₇₋₂₀ alkylaryl, C₇₋₂₀ arylalkyl, C₈₋₂₀ arylalkenyl, phenyl, and substituted phenyl.

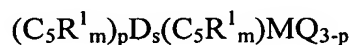
17. (Previously Presented) The supported metallocene compound according to claim 15, wherein $-CR'_2G$ comprises t-butyl.

18. (Canceled)

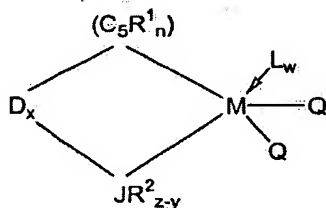
19. (Original) The supported metallocene compound according to claim 15, wherein a is 6.

20. (Currently Amended) A method for preparing a supported metallocene compound, the method comprising the step of:

reacting a metallocene compound of Chemical Formula 1 or Chemical Formula 2 with a dehydroxylated silica support including a hydroxyl group amount of less than 0.5 mmol/g silica in an organic solvent, wherein Chemical Formula 1 comprises:



and wherein Chemical Formula 2 comprises:



wherein at least one moiety selected from the group consisting of R^1 , R^2 , and D is substituted by a group of chemical Formula 6, wherein:

M is a transition metal of Group 4;

$(C_5R^1_m)$ and $(C_5R^1_n)$ each comprise a cyclopentadienyl ring, wherein R^1 ,

which are the same or different, are selected from the group consisting of

hydrogen, C_{1-40} alkyl, C_{3-40} cycloalkyl, C_{6-40} aryl, C_{2-40} alkenyl, C_{7-40} alkylaryl,

C₇₋₄₀ arylalkyl, C₈₋₄₀ arylalkenyl, and a metalloid of Group 14 substituted by a hydrocarbyl group; or two R¹ form a hydrocarbyl group which joins together two adjacent carbon atoms of a cyclopentadienyl ring to form one or more C₄-C₁₆ rings;

D is selected from the group consisting of an alkylene carbon chain, an arylene carbon chain, an alkenylene carbon chain, a dialkyl germanium, a dialkyl silicon, an alkyl phosphine, an alkyl amine group substituting on and bridging two cyclopentadienyl ligands, and an alkyl amine group substituting on and bridging a cyclopentadienyl ligand and JR²_z ligand by covalent bonds;

R² is selected from the group consisting of hydrogen, C₁₋₄₀ alkyl, C₆₋₄₀ aryl, C₂₋₄₀ alkenyl, C₇₋₄₀ alkylaryl, and C₇₋₄₀ arylalkyl;

J comprises an element of Group 15 or Group 16;

Q, which are the same or different, are selected from the group consisting of halogen, C₁₋₂₀ alkyl, C₂₋₂₀ alkenyl, C₆₋₂₀ aryl, C₇₋₂₀ alkylaryl, and C₂₋₂₀ alkylidene;

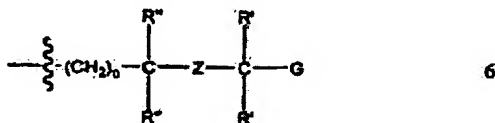
L comprises a Lewis base;

s is 0 or 1 and p is 0, 1 or 2, provided that when p is 0 then s is 0, when s is 1 then m is 4 and p is 1, and when s is 0 then m is 5 and p is 0;

when J is an element of Group 15 then z is 3, and when J is an element of Group 16 then z is 2;

x is 0 or 1, provided that when x is 0 then n is 5, y is 1, and w is greater than 0, and when x is 1, then n is 4, y is 2, and w is 0; and

wherein the group of Chemical Formula 6 comprises:



wherein Z is an oxygen atom or a sulfur atom;

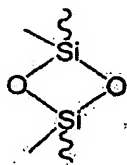
R', which are the same or different, are selected from the group consisting of hydrogen, C₁₋₂₀ alkyl, C₃₋₂₀ cycloalkyl, C₆₋₂₀ aryl, C₂₋₂₀ alkenyl, C₇₋₂₀ alkylaryl, C₇₋₂₀ arylalkyl, and C₈₋₂₀ arylalkenyl; or two R' join together to form a ring;

R'', which are the same or different, are selected from the group consisting of hydrogen, C₁₋₂₀ alkyl, C₃₋₂₀ cycloalkyl, C₆₋₂₀ aryl, C₂₋₂₀ alkenyl, C₇₋₂₀ alkylaryl, C₇₋₂₀ arylalkyl, and C₈₋₂₀ arylalkenyl;

G is selected from the group consisting of C₁₋₂₀ alkyl, C₃₋₂₀ cycloalkyl, C₆₋₂₀ aryl, C₂₋₂₀ alkenyl, C₇₋₂₀ alkylaryl, C₇₋₂₀ arylalkyl, and C₈₋₂₀ arylalkenyl, C₁₋₂₀ alkoxy, C₆₋₂₀ aryloxy, C₁₋₂₀ alkylthio, C₆₋₂₀ arylthio, phenyl, and substituted phenyl; or G and R' join together to form a ring;

a is an integer of 4 to 8, provided that when Z is a sulfur atom then G is alkoxy or aryloxy; and when G is not an alkoxy or aryloxy then Z is an oxygen atom; and

wherein the dehydroxylated silica support is of formula:



whereby a reactive bond between a silicon atom and an oxygen atom of the dehydroxylated silica support is cleaved, whereby a bond between an oxygen atom and a carbon, atom in Chemical Formula 6 of the metallocene compound is cleaved to yield a metallocene compound portion comprising the oxygen atom and a remaining portion comprising the carbon atom, and whereby the metallocene compound portion is bonded to the silicon atom of the dehydroxylated silica support, and simultaneously the remaining portion is bonded to the oxygen atom of the dehydroxylated silica support.